From 178 ova of which 156 hatched only 5 pupated. This was, apparently, a weak brood as No. 2.

The strain will be continued and further results published in due course.

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The author takes this opportunity of expressing his appreciation to the following for their co-operation:—

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Porcorum, Sandy Down, Boldre, Lymington, Hants. October 1966.

Butterfly Expedition to Iran, 1966

By Major General SIR GEORGE JOHNSON, K.C.V.O., C.B., C.B.E., D.S.O.

OUTWARD JOURNEY

My wife and I left London on 14th May in a long Land Rover with dormobile body. Crossing the channel by the Dover-Calais ferry, we spent the first night at Ostend. We then had an uneventful run down the German autobahns to Saltzburg, which we reached on 17th May.

The following day we found sheets of pheasant's eye narcissus on the Pötschen pass, and a little further on *Erebia medusa* Schiff. already out by the roadside. Proceeding via Graz, we crossed the Austro-Yugoslav frontier on 19th May and spent that night at a motel south-east of Zagreb. Next morning we woke up to a magnificent dawn chorus of nightingales and golden orioles from a surrounding oak wood. Later that day we stopped for lunch in a rather marshy wood about 50 miles short of Belgrade. Here we took on the roadside a very fresh *Pararge achine* Scop. and a female and male of *Lycaena dispar* Haw. We also had much trouble from some amazingly blood-thirsty mosquitoes.

We continued via Skopje, Thessalonica and Alexandropoulis reaching Istanbul on 24th May. The main items of interest were many handsome black-headed buntings by the roadside in Macedonia, and an excellent fish dinner in Thessalonica.

Next morning we crossed the Bosphorus by ferry, seeing many flocks of sheerwaters flying up and down the narrow strait, and reached Ankara that evening. En route we saw our first black storks. The white ones had been in evidence since entering Yugoslavia.

On 26th May we did a 270 mile run to Samsun on the Black Sea, stopping at an area recently planted with young trees and consequently ungrazed, near Corum. Here some butterflies were flying including *Zerinthia cerisyi* Bdv., *Leptidea duponcheli* Staud., *Cupido sebrus* Hübn. and *Glaucopsyche alexis* Poda.

The Black Sea coast, though beautiful, was uninteresting as regards butterflies and birds. It had one fifty mile stretch of twisty, narrow, and much potholed gravel road between Ordu and Trabzon, the only really bad stretch we met in Turkey. An unusual feature was the quantity of orchards of hazel nuts, one of the major local products.

We left Trabzon on 29th May to cross the Zigana Pass (6100 ft.). On the way up, in the woods on the north side of the pass, we took *Leptidea morsei* Fenton, not apparently recorded from Turkey before. These woods also contained sheets of *Rhododendron ponticum* and *Azalea ponticum* in full flower. On the south side of the pass we found *Z. cerisyi* common on one slope where its foodplant, a species of Aristolochia, was abundant. That night we slept for the first time in the Land Rover near the small town of Bayburt.

Next day on the way to Erzerum we crossed the Kop Dag (7200 ft.), another high pass where there were many primulas and other alpines with crocus just coming out on the edge of snow patches. As we began the ascent from the north we found a rocky hillside comparatively ungrazed, and by the roadside at the foot of this, a number of butterflies were flying. They included *L. duponcheli*, *Anthocaris damone* Bdv. and *A. gruneri* H.-S.

That night we camped east of Erzerum, and the following day crossed yet another high pass, the Tahir (7500 ft.), where again there were many lovely flowers, and in particular, on its lower slopes magnificent paeonies and large oncocyclus iris with white and purple-brown petals which could be seen from hundreds of yards away. On the rivers in this area, one of which is the upper Euphrates, pairs of breeding ruddy sheldrake were not uncommon. Calandra larks, rock sparrows, black-headed buntings, isabelline wheatears and black-headed wagtails were all features of the landscape. We found the nest of a Calandra lark within a few yards of our pitch for the night.

On 1st June we passed just below Ararat, a magnificent hill, still with much snow on its upper slopes, and crossed the Turko-Iranian frontier at Bazorgan.

IRAN

We found our first Persian butterflies soon after the frontier on stony slopes by the roadside just east of Maku. These included *Pseudochazara telephassa* Hübn., *Coenonympha saadi* Koll., and a fine form of *Melitaea persea* Koll. That evening, after some trouble with an irrigation channel from which we were rescued by the combined efforts of our own four-wheel drive and a pull from a friendly Persian jeep-driver, we slept in the Land Rover by the roadside. The following night on the road to Tabriz we pulled off into a lonely bit of desert. Here for once, there were not even the usual herd boys who generally watched every movement in or about the Land Rover with avid interest during the hours of daylight.

We reached Tabriz on 3rd June after a long and dusty drive over badly corrugated roads and we were very glad of the shower which was the only form of bath provided by the best hotel. Next day we did 200 miles, again mostly over bad roads to Zinjan, where we found a good modern hotel. Here we stayed two nights and spent the morning of 5th June exploring some low and arid hills just south of the town. Here again were *P. telephassa* in considerable numbers with a few *P. persephone* Hübn. including the female form with brown instead of white bars.

On 6th June we continued to Tehran, getting on to the tarmac with some relief, 100 miles short of the city. Here we hoped to meet Dr. L. H. Higgins, coming out by air on 7th June. Unfortunately he was delayed for a week, so after having the Land Rover serviced at the very efficient Rover assembly plant in Tehran, we moved out to the Darband Hotel on the northern outskirts of the city. Here we were nearly 2000 feet higher up, on the slopes of the Elburz range, and it was pleasantly cooler, particularly at night (elevation 6000 ft.). For the next day or so we explored the roads running east along the foothills, and the only one running back into the range in this area. The hills on the Tehran side are arid, very steep and stony, and heavily grazed by goats. Accessible localities with a good butterfly population were scarce.

The first locality we found was 12 miles east of the hotel, near a hamlet called Lashgarak. Here bare and stony slopes with a little desiccated-looking vegetation sloped down to the Jaji Rud river. These held many *Melanargia larissa* Hübn., some *M. persea* and a few of the commoner Satyrids, but little else.

The Jaji Rud valley running down from the high Elburz showed more promise and was accessible by road as far as Shimshak twenty miles up the river. For most of our stay at the Darband we concentrated on one area about 19 miles from the hotel. This seemed by far the most promising and accessible in the valley. It consisted of easy eastward-facing slopes near the hamlet of Kamarkhani. They were reached by a rather precarious bridge over the fast Jaji Rud, and were irrigated, growing vines, fruit trees, wheat, and patches of vetches, etc., to be cut for hay. Above these rose the steep, stony, and rather bare slopes of the hills. On these slopes and along a dry water-course at their foot, butterflies were really numerous and there were birds including a few chukor, black-headed buntings, and even a dipper on the small torrent which fed the irrigation channels. Dr. Higgins joined us on 15th June and we worked this area daily until we left for the Caspian on 20th June. The more interesting species included the following:—*Pontia chloridice* Hübn. (scarce), *Colias aurorina* H.-S. (2 ♀♀, one the white variety), *Pararge climene* Esp. (abundant), *Satyrus parthica* Led. (the ♂♂ with white venation and large orange patch on underside), *Epinephele davendra* Moore (not numerous, on thyme near the stony wadi bed where it took refuge when disturbed), *Melitaea arduinna* Esp. (on the lower slopes), *Plebejus eurypilus* Frr. (common) and *P. loewii* Zeller (a few).

Our destination on the Caspian was Chalus, about 120 miles from Tehran, for which we set out via Karadj and then across the Elburz over the Gach Sar pass. The road is well surfaced, very picturesque and mountainous, passing through several tunnels, one of which, at the summit of the pass, is about a mile long and one way only. The south side of the watershed is dry and arid except for the Karadj river which provides water for some irrigation. At the top of the pass (8000 ft.) the climate changes, the hills on the northern side being green and well watered from the evaporation and subsequent condensation of the Caspian. The lower slopes are clothed with dense deciduous forest and most of the level ground between the hills and the Caspian is taken up by paddy fields. The descent to the Caspian (100 ft. below sea level) is spectacular to a degree, but the road is well engineered, and provided one does not look over the edge, not particularly alarming! On the way over we stopped at some meadows soon after leaving the Gach Sar tunnel. Here we found *Coenonympha leander* Esp. A little further on at 7500 feet we found an uncut patch of meadow, full of flowers, and here my wife took a fresh *Argynnis alexandra* Mér. on a thistle. A great prize. Near this meadow, on slopes overhanging the road, were a number of bushes of *Colutea arborescens* and, sure enough, flying round them were a number of *Jolas*

jolas Ochs. Though many were worn we secured a fair number in good condition.

That night at Chalus it rained heavily and continued to do so the next day. We drove some way eastwards along the coast but saw little of interest except a flock of rose-coloured starlings feeding by the roadside.

On 22nd June we retraced our steps over the Gach Sar pass but did not get into sunshine again until near the tunnel at the top. Here we stopped for a short time to take some more *C. leander*. We also found a few of the local forms of *Parnassius mnemosyne* L. and *Lycaena hippothoë* L. We went on through Tehran to Abe Ali about 30 miles further east where we stayed at the Ozoneh hotel, a winter ski resort at about 8000 feet. This was to be our base to explore Demavend, the great extinct volcano, which, from a height of 17,000 feet dominates the Elburz range.

To reach Demavend we had to continue on the main Amol road towards the Caspian for a further 11 miles to Purlur, a small village on the River Lar at the foot of the snow-capped mountain. From Purlur, an unmetalled road crosses the Lar and continues round the south slopes of Demavend to a village called Rheyne. This road, rising to about 8000 feet, was the nearest motorable approach to the mountain. A jeep track takes off from this road to the left about a mile above Purlur and leads round the south-west shoulder of the hill and down again to the Lar, which is full of trout. Some 8 miles further on the British Embassy maintains a summer camp as a week-end escape from the heat of Tehran.

Butterflies of interest were unfortunately not very common, perhaps because of the height we were a little early. Odd *Colias aurorina* were seen. *Fabriciana niobe* L. was common on thyme and the Satyrids *P. telephassa, pelopea* and *persephone* were widespread in small numbers. We took a few *Pseudochazara mamurra* H.-S. very fresh and probably just emerging, and one or two of the hairstreaks *Strymon elta* Higgins. In meadows on the western outskirts of Purlur we took a number of *Agrodiaetus pseudoactis* Forster. There were some nice birds, scarlet grosbeaks beside the Lar in long grass and vegetation, rock thrushes, rock buntings, rock nuthatches and horned larks were to be seen on the slopes of Demavend and once we saw a lammergeier.

We left Abe Ali on 28th June for a short visit to the Gach Sar hotel below the pass of that name at 7200 feet. On the afternoon of our arrival my wife and I took a walk up the hill to the highest of the irrigation channels on the right bank of the Karadj river opposite the hotel. A hedge ran along the channel, full of *Colutea arborescens* and we were soon catching *J. jolas,* mostly rather worn. Suddenly on a spray, I saw a strange small pierid which I did not recognize but which turned out to be *Metaporia leucodice* Ev. We soon found it to be quite common along the hedge and it was particularly attracted to certain small willow trees, fluttering weakly up and down them, and often sitting in pairs on the leaves. Many other whites, particularly *Pieris rapae* L. and *P. pseudo-napi* Warr. were flying in the same area together with a number of *Celastrina argiolus* L.

Next day we drove through the tunnel to the area where we caught *A. alexandra* on 20th June. Dr. Higgins was successful in getting another fine male of this species. We caught a number of *Melitaea didyma* Esp. with beautiful dark females, a pair of the large spotted skipper *Muschampia tessellum* Hübn. and several blues of the *Agrodiaetus* genus which were not identifiable on the spot. After lunch at the hotel, we again tried the hedge for *M. leucodice* and here my wife took a small green hairstreak which proved to be *Callophrys kolak* Higgins, previously only recorded from Turkey.

On 30th June, we returned to our meadow beyond the tunnel, getting several more blues including a bronze-looking insect caught by Dr. Higgins, which turned out to be *A. marcida* Led.; we also tried a neighbouring slope with a good growth of a fine form of wild *nepeta*. Large tortoiseshells were abundant on it and mostly of a form which appeared to be half way between *Nymphalis polychloros* L. and *N. xanthomelas* Herr. Here we secured three more fresh males of *A. alexandra*.

On 1st July we left for Hamadan, which lies 200 miles to the south-west of Tehran on the edge of the Zagros mountains. The town is dominated from the south by a hill over 10,000 feet high called Kuh-i-alwand. At the time of our arrival there were still a few small wreaths of snow on its northern face. The town itself is one of the highest in Iran, lying at 6000 feet.

On 2nd July we motored 28 miles down the Kermanshah road to the Shah pass where the road crosses it at 7500 feet. The country was much grazed, and apart from a few common Satyrids there was not much about. We did, however, get a single *Epinephele wagneri* H.-S., an insect new to us, on slate screes near the top of the pass.

Next day we explored a track leading up into the Kuh-i-alwand between its twin peaks. The track starts on the outskirts of the town but is very rough and only passable to a Land Rover for about 5 miles. A stream, much of which is diverted into irrigation channels, runs beside the track, and on either side were extensive plantations of fruit trees with areas of hay still uncut and ungrazed. This valley was our hunting ground for the next few days, the hay fields providing some interesting blues including *Agrodiaetus hamadanensis* de Lesse, a beautiful large deep blue species, *A. sennanensis* de Lesse, another large, but grey-green species, and *Meleageria elamita* le Cerf, a species much larger and of a different shade of blue from the more familiar *Meleageria daphnis* Schiff. from Europe and Turkey. On return to England Dr. Higgins found that both *A. hamadanensis* and *A. sennanensis* are unrepresented in the national collection at the British Museum. Other butterflies which were abundant included *A. larissa, P. climene, H. lycaon,* and the common Satyrids. In particular, a large form of *Brintesia circe* Fabr., a species we saw nowhere else, abounded in the orchards and hay fields. Dr. Higgins also collected a number of dark insects similar to *H. lycaon* which turned out to be *H. interposita* Erschoff. The Melitaeids were represented by a small colony of *M. persea* on slopes above the cultivation and *Pandoriana pandora* Schiff. was common everywhere. We paid one more visit to the Shah pass securing another *E. wagneri* and a few *A. ripartii* Frr. On this occasion we saw several flocks of rose-coloured starlings and found one pair still feeding barely fledged young.

We left Hamadan on 10th July for Abe Ali via Tehran with a view to a further assault on Demavend for *Colias sagartia* Led. and *Erebia iranica* Gr. Grsh. Unfortunately owing to the indisposition of one of our party this attempt did not succeed. Dr. Higgins left by air for London on 13th July and my wife and I started back by Land Rover on 22nd July.

Our general impression about butterflies in Iran was that one had to work pretty hard for what one got. It is a very large country and an enormous proportion is desert or grain cultivation on the desert edges and steppe land, and so unsuited to butterfly life. The slopes of the hills are very steep, stony, and, except on the Caspian side, arid and over-grazed. Irrigation produces patches of cultivation and hay field which are butterfly haunts.

Unless very young and active collectors are much confined to the vicinity of roads and these are few and far between.

Even when a suitable area was found the more desirable species were seldom present in numbers and the day's bag was never very large.

Owing to the heat, we found it desirable to be on the ground by 7.30 a.m. and the first few hours were the most profitable, the butterflies flying faster and being more difficult to see as the heat increased. We found it advisable to pack up about mid-day and return to our hotel for much needed refreshment.

HOMEWARD JOURNEY

My wife and I left for home on 22nd July and made no attempt to collect in the very desiccated countryside until well into Turkey. We crossed the frontier on 24th July and slept in the Land Rover immediately below Mount Arrarat. Next day we crossed the Tahir Pass, 6800 feet, and stopped for a short time to collect some blues.

On 26th July we crossed the Kop Dag pass, 7170 feet, but saw little except a few blues. At its foot, however, on the north side we stopped beside a rocky hillside where we had found butterflies on our outward journey. Here we found the summer brood of *L. duponcheli* and two new Satyrids, *Pseudochagera geyeri* H.-S. and *P. bischoffi* H.-S.

On 27th July we crossed the Zigana Pass, but to our disappointment in cloud and rain. There were still many fine flowers, particularly campanulas of various species.

We did no more collecting until we reached a forestry area five miles north of Corum where again we had found butterflies on our way out. Here we found *Arethusana arethusa* Schiff. and a nice blue, *A. menalcus* Frr., not dissimilar to *A. dolus* Hübn.

Instead of traversing Yugoslavia we decided to cross the Epirus and take the car ferry from Igoumenitzou, opposite Corfu, to Brindisi.

We spent the night of 3rd August at Kalambaka below the strange rock monasteries of the Meteora. Here we found a few *M. didyma* Esp. of a very pale form. Next day we crossed the Pindus range by a very indifferent road stopping one or twice to prospect for butterflies. We took *Hipparchia statilinus* Hb. and *Pseudochazara amalthea* Triv. and at the highest point of the road found *Parnassius apollo* L. and *Lysandra coridon* Poda.

On 4th August we crossed to Brindisi reaching Turin on 7th August. Next day we hoped to collect on the Mont Cenis pass but when we got there the sun was fast disappearing behind clouds. We only secured a few *Erebia montanus* de Pr., *E. tyndarus* Esp. and one *Polyommatus eros* Ochs. As we descended to wards Chambery we ran into heavy rain.

Our only further attempt at collecting was on 9th August where in lucerne fields 100 miles south-east of Paris we took a fresh series of *Colias hyale* L.

So ended a most interesting expedition.

A list of species recorded follows:—

E=Elburz Range Iran. T=Turkey. G=Greece. A=Austria.
H=Hamadan Iran. Y=Yugoslavia. F=France.

Papilio machaon L.	E.
P. alexanor Esp.	E.
Iphiclides podalirius L.	All
Zerinthia cerisyi Bdv.	T.
Parnassius apollo L.	G.
P. mnemosyne L.	A.
Leptidea sinapis L.	A.
L. morsei Fenton	T.
L. duponcheli Stgr.	T.
Anthocaris damone Bdv.	T.
A. cardamines L.	T.
A. gruneri H.-S.	T.
Euchloe ausonia Hübn.	T.
Pontia daplidice L.	All
P. chloridice Hübn.	E.
Pieris brassicae L.	All
P. krueperi Stgr.	E.
P. rapae L.	All
P. pseudorapae Warr.	E.
P. ergane G.H.	E.
P. napi L.	E.T.
P. mannii Mayer	T.
P. bryoniae Ochs.	A.
Aporia crataegi L.	E.
Metaporia leucodice	Ev.E.
Colias hyale L.	F.
C. australis Vty.	T.
C. crocea Fourc.	All
C. aurorina H.-S.	E.
Gonepteryx rhamni L.	All
Melitaea didyma Esp.	E.G.
M. persea Koll.	E.H.
M. trivia W.V.	E.
M. arduinna Esp.	E.
M. cinxia L.	E.
M. phoebe W.V.	E.
Mellicta athalia Rott.	Y.
Issoria lathonia L.	E.H.
Fabriciana niobe L.	E.H.
Argynnis alexandra Men.	E.
Pandoriana pandora Schiff.	E.H.
Vanessa cardui L.	All
V. atalanta L.	E.
Polygonia egea Cramer	E.
P. c-album L.	F.
Nymphalis polychloros L.	E.
N. xanthomelas Schiff. (1)	E.
Aglais urticae L.	E.
Melanargia larissa Hübn.	E.H.
Pararge aegeria L.	F.
P. achine Scop.	Y.
P. megera L.	All
P. maera L.	E.
P. climene Esp.	E.H.
Hipparchia semele L.	T.
H. statilinus Hübn.	G.
Chazara briseis L.	E.H.T.
C. persephone H.-S.	E.H.
C. bischoffi H.-S.	T.
Pseudochazara amalthea Friv.	G.
P. telephassa Hübn.	E.H.
P. pelopea Klug.	E.H.T.
P. mamurra H.-S.	E.
P. geyeri H.-S.	T.
Arethusana arethusa Schiff.	T.
Brintesia circe Fabr.	H.
Satyrus parthica Led.	E.
S. cordula Fabr.	G.
Pyronia tithonus L.	T.G.
Hyponephele lycaon Kuhns.	T.
H. lupinus Costa	T.E.H.
H. interposita Erschoff.	E.H.
H. amardaea Led.	E.
H. narica Hübn. (2)	H.
H. davendra Moore	E.
H. wagneri H.S.	H.
Coenonympha iphis Schiff.	Y.
C. leander Esp.	E.
C. pamphilus L.	All
C. saadi Koll	E.H.
Erebia medusa Schiff.	A.
E. tyndarus Esp.	F.
E. montanus Fabr.	F.
Strymon ilicis Esp.	Y.
S. elta Higgins	E.
Callophrys rubi L.	T.
C. kolak Higgins	E.
Lycaena tityrus Poda	E.H.
L. alciphron Rott.	E.
L. phloeas L.	All
L. dispar Haw.	Y.
L. thersamon Esp.	E.T.
L. thetis Klug.	T.
L. hippothoë L.	E.
Chilodes galba Led.	E.
Turanana panagea H.-S.	E.
Lampides boeticus L.	E.
Everes argiades Pall.	Y.
Cupido sebrus Hübn.	T.
Celastrina argiolus L.	E.

Philotes orion Pall.	T.
P. vicrama Moore	E.
Jolana jolas Ochs.	E.
Glaucopsyche alexis Rott.	T.
Lycaeidas argyrognomon Bgstr.	F.
Plebejus argus L.	E.H.
P. eurypilus Frr.	E.
P. loewii Zell.	E.T.
P. pylaon Fischer	E.
Cyaniris semiargus Rott.	E.T.
Polyommatus icarus Rott.	All
P. eroides Triv.	T.
P. eros Ochs.	F.
Lysandra bellargus Rott.	E.H.T.
L. coridon Poda.	G.
L. olympica Led.	T.
L. amandus Scheren	E.
Agrodiaetus admetus Esp.	E.
A. marcida Led.	E.
A. ripartii Frr.	E.H.
A. iphigenia H.-S.	T.
A. phyllis Christ.	T.
A. posthumus Christ.	E.
A. sennanensis de Lesse	H.
A. hamadanensis de Lesse	H.
A. menalcus Frr.	T.
A. pseudoactis Forster	I
A. cyanea Stgr.	E.H.
Meleageria daphnis Schiff.	T
M. elamita le Oerf	H.
Carcharodus alceae Esp.	T
C. orientalis Rev.	E.
C. lavaterae Esp.	H.
Pyrgus malvae L.	E.H.
P. armoricanus Obth.	E.H.
P. carthami Hübn.	T.
Spialia orbifer Hübn.	E.H.
S. phlomidis H.-S.	E.
Muschampia poggei Led.	E.H.T.
M. tessellum Hübn.	E.
Thymelicus lineola Ochs.	E.H.
T. flava Brunnich	H.

NOTES

1. A number of tortoiseshells very near to *N. xanthomelas* were taken in the Elburz. Their exact identity is under investigation.
2. A single female from the Kuh-i-alwand resembles Seitz's figure of *H. narica*, but further specimens and females are required for certain determination.

Castlesteads, Brampton, Cumberland. 10.xi.1966.

The Moth Trap in November in North West Surrey

By R. F. Bretherton, C.B., M.A., F.R.E.S.

November's weather is usually a deterrent to regular working of the moth trap, but many of us go on using it occasionally when the nights look favourable Turning over my records from 1952 to 1962 at Ottershaw and since then at Bramley, I see that my trap was run on average for about eight November nights a year. Recently I have tried it more often --15 nights in 1966—in the hope of getting some of the late-arriving scarce migrants which have favoured some of my neighbours. But to get any significant attendance one needs a dusk temperature of at least 45°F. and an absence of wind, and such conditions are not frequent even in the best Novembers.

During the fifteen years over 2,000 Macros and Pyrales have been noted, including a rather surprising total of 45 species, besides a few Tortrices and Tinae of which no exact count was kept. The highest score was 106 moths, of twenty species, on 1st November 1954; and the largest number of species seen in a year was 25, in 1961 and 1962.

Half-a-dozen common species have their main emergence and flight periods in November, though the first two usually first appear in October and all can last into December: *Poecilocampa populi* L., *Colotois pennaria* L., *Oporphtera fagata* Scharf., *O. brumata* L., *Erannis defoliaria* Clerck,